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**From:** Smith, Emily J. [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=3170DC8557CB488285DE7652AD162CDD-SMITH, EMILY J.]  
**Sent:** 2/27/2020 5:12:05 PM  
**To:** Washington, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fdc3e8ce9f1d45c4894881ff420ca104-Washington, John]  
**Subject:** RE: ORD R2/NJ PFAS Fingerprinting Study Manuscript

Sounds good John! Good luck with the edits! Congrats again on your paper- getting it accepted by Science is a big deal!



-Emily

Emily J. Smith  
Communications & Outreach  
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E-mail: [smith.emily@epa.gov](mailto:smith.emily@epa.gov)

*"Protecting human health and the environment by delivering innovative measurement and modeling solutions to EPA and our partners"*

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**From:** Washington, John <Washington.John@epa.gov>  
**Sent:** Thursday, February 27, 2020 8:38 AM  
**To:** Smith, Emily J. <Smith.Emily@epa.gov>  
**Subject:** Re: ORD R2/NJ PFAS Fingerprinting Study Manuscript

Hi Emily,

I suggest you hold on the title for now. The editor at the journal wants a title change. I have been so busy, I am only starting to address comments today, a full week after receiving the review. This is stressing me because I don't want to delay responding to a Science acceptance. So I will let you know what the editor and I agree on ASAP.

Thanks!  
John

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**From:** Smith, Emily J. <Smith.Emily@epa.gov>  
**Sent:** Wednesday, February 26, 2020 5:21 PM  
**To:** Washington, John <Washington.John@epa.gov>  
**Subject:** FW: ORD R2/NJ PFAS Fingerprinting Study Manuscript

Hi John! Congrats on your paper being accepted by the journal *Science*! That's great news! I'm working on an EPA desk statement summarizing your research and findings. (I'll share that with you for your review when I have the draft

completed.) However, I wanted to check in with you about the title of your paper. The last manuscript I have from you is titled "Nontargeted mass-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey." Is that still correct? I know that sometimes manuscript titles can sometimes change in process.

Thanks much!

-Emily

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**From:** Watkins, Tim <[Watkins.Tim@epa.gov](mailto:Watkins.Tim@epa.gov)>  
**Sent:** Monday, February 24, 2020 1:19 PM  
**To:** Smith, Emily J. <[Smith.Emily@epa.gov](mailto:Smith.Emily@epa.gov)>  
**Subject:** Fwd: ORD R2/NJ PFAS Fingerprinting Study Manuscript

Here is the email I mentioned.

Sent from my iPhone

Begin forwarded message:

**From:** "Orme-Zavaleta, Jennifer" <[Orme-Zavaleta.Jennifer@epa.gov](mailto:Orme-Zavaleta.Jennifer@epa.gov)>  
**Date:** February 21, 2020 at 12:35:08 PM EST  
**To:** "Wright, Peter" <[wright.peter@epa.gov](mailto:wright.peter@epa.gov)>, "Ross, David P" <[ross.davidp@epa.gov](mailto:ross.davidp@epa.gov)>, "Idsal, Anne" <[idsal.anne@epa.gov](mailto:idsal.anne@epa.gov)>, "Dunn, Alexandra" <[dunn.alexandra@epa.gov](mailto:dunn.alexandra@epa.gov)>, "Bodine, Susan" <[bodine.susan@epa.gov](mailto:bodine.susan@epa.gov)>, "Schiermeyer, Corry" <[schiermeyer.corry@epa.gov](mailto:schiermeyer.corry@epa.gov)>, "Brazauskas, Joseph" <[brazauskas.joseph@epa.gov](mailto:brazauskas.joseph@epa.gov)>, "Benevento, Douglas" <[benevento.douglas@epa.gov](mailto:benevento.douglas@epa.gov)>, "Jackson, Ryan" <[jackson.ryan@epa.gov](mailto:jackson.ryan@epa.gov)>, "Cook, Steven" <[cook.steven@epa.gov](mailto:cook.steven@epa.gov)>, "Breen, Barry" <[Breen.Barry@epa.gov](mailto:Breen.Barry@epa.gov)>, "Forsgren, Lee" <[Forsgren.Lee@epa.gov](mailto:Forsgren.Lee@epa.gov)>, "Shaw, Betsy" <[Shaw.Betsy@epa.gov](mailto:Shaw.Betsy@epa.gov)>, "Kadeli, Lek" <[Kadeli.Lek@epa.gov](mailto:Kadeli.Lek@epa.gov)>, "Fischer, David" <[Fischer.David@epa.gov](mailto:Fischer.David@epa.gov)>, "Starfield, Lawrence" <[Starfield.Lawrence@epa.gov](mailto:Starfield.Lawrence@epa.gov)>, "Irving, John" <[Irving.John@epa.gov](mailto:Irving.John@epa.gov)>, "Grantham, Nancy" <[Grantham.Nancy@epa.gov](mailto:Grantham.Nancy@epa.gov)>  
**Cc:** "Lopez, Peter" <[lopez.peter@epa.gov](mailto:lopez.peter@epa.gov)>, "Dunlap, David" <[dunlap.david@epa.gov](mailto:dunlap.david@epa.gov)>, "Gillespie, Andrew" <[Gillespie.Andrew@epa.gov](mailto:Gillespie.Andrew@epa.gov)>, "Watkins, Tim" <[Watkins.Tim@epa.gov](mailto:Watkins.Tim@epa.gov)>, "Kopec, Slawomir" <[kopec.slawomir@epa.gov](mailto:kopec.slawomir@epa.gov)>, "Mugdan, Walter" <[Mugdan.Walter@epa.gov](mailto:Mugdan.Walter@epa.gov)>, "Williamson, Anahita" <[Williamson.Anahita@epa.gov](mailto:Williamson.Anahita@epa.gov)>, "Iglesias, Ariel" <[Iglesias.Ariel@epa.gov](mailto:Iglesias.Ariel@epa.gov)>, "Mears, Mary" <[Mears.Mary@epa.gov](mailto:Mears.Mary@epa.gov)>, "Laureano, Javier" <[laureano.javier@epa.gov](mailto:laureano.javier@epa.gov)>, "Mitchell, Judy-Ann" <[Mitchell.Judy-Ann@epa.gov](mailto:Mitchell.Judy-Ann@epa.gov)>, "Evangelista, Pat" <[Evangelista.Pat@epa.gov](mailto:Evangelista.Pat@epa.gov)>, "Wilson, Eric"

Colleagues,

We want to make you are aware of results from a manuscript that ORD provided to Region 2, OCSPP, OLEM, OW and OECA for advanced notification, and which is a result of a collaborative project between EPA and New Jersey Department of Environmental Protection (NJDEP) to fingerprint perfluorinated compounds from two facilities in New Jersey.

We are writing to make you aware of the results of this work. An executive level briefing by ORD to Region 2 is being planned for March 3<sup>rd</sup>, at 11AM – 12PM (eastern time). In addition, a more in-depth technical presentation and discussion will be conducted from 1:30 – 3:30 PM that same day. Arrangements will be made to include any interested AAs in any of these meetings, remotely. For additional information on this briefing, your staff may contact Ariel Iglesias, Director of Region 2's Land, Chemicals and Redevelopment Division at 212-637-3315 or [Iglesias.Ariel@epa.gov](mailto:Iglesias.Ariel@epa.gov). If you or any members of your staff have any questions regarding the study, please feel free to contact Tim Watkins, who is the Director of ORD's Center for Environmental Measurement and Modeling (CEMM) at 919-541-5114 or [Watkins.Tim@epa.gov](mailto:Watkins.Tim@epa.gov).

## **BACKGROUND**

In 2016, NJDEP requested ORD's assistance to investigate legacy PFAS distribution in New Jersey, including two potential PFAS sources in the southwestern part of the state, near the Delaware River, that are RCRA corrective action facilities: Solvay Specialty Polymers in West Deptford and Chemours in Deepwater. These two facilities have been undergoing investigation and cleanup activities for traditional RCRA regulated contaminants for over 25 years. However, over the past decade increased awareness of the prevalence and persistence of PFAS in the environment has led to NJDEP and Region 2 pursuing targeted investigations of on- and off-site PFAS releases from these facilities. In particular, over the course of these investigations Solvay asserted that PFAS concentrations believed to be caused by its manufacturing operations were likely being generated by other sources as well. To carry out the fingerprinting investigation to aid in identifying the origin of PFAS contamination, NJDEP collected soil, vegetation and water samples from transects and from across much of the state and delivered the soil/vegetation samples and water samples to research facilities in ORD's National Exposure Research Laboratory (NERL) located in Athens GA and RTP, NC, respectively. The ORD research facilities that received the samples are now part of ORD's Center for Environmental Measurement and Modeling (CEMM). The manuscript submitted for advanced notification presents results and analyses of soil samples only. Additional manuscripts are anticipated.

## **RESULTS**

ORD identified ten new PFAS replacement compounds and elevated levels of legacy PFAS compounds in the soil and used the data to develop a fingerprint of legacy PFAS compounds. The data were also used to develop contour maps of both the new PFAS replacement compounds and legacy PFAS compounds which formed a pattern focusing on both potential sources identified by NJDEP.

Collectively, the findings to date: (i) identified ten novel PFAS not previously detected in the environment, including congeners with no previous reports; (ii) suggest many congeners have bioconcentration potentials on the order of or greater than PFOA and PFOS; (iii) document the widespread distribution of PFAS replacement compounds over much of densely populated New Jersey; (iv) indicate the source of these replacement compounds in New Jersey likely are from Solvay; (v) were used to fingerprint historical sources of legacy long-chain PFAS C11 and C13 likely being in-part from Solvay, and C10 and C12 likely being in-part from Chemours; and (vi) document discernable signals of these legacy PFAS across the expansive breadth of south Jersey persisting today.

In addition, one of the PFAS replacement compounds was detected in “background samples” collected from the central and northern areas of the state (Trenton and West Milford). These “background samples” were intended to represent typical soils in New Jersey, at locations remote from Solvay and Chemours. The same PFAS replacement compound was also found in a sample collected in Merrimack, NH, as part of an unrelated effort. The spatial distribution of the PFAS replacement compounds across NJ and potentially as far as NH are consistent with the dominant direction of prevailing winds and consistent with the PFAS replacement compounds found near the Solvay facility.

#### **EPA-STATE INTERACTION**

On December 9, staff from ORD, Region 2 and NJDEP met to discuss the PFAS fingerprinting findings to date, with emphasis on the PFAS replacement compounds and the magnitude of off-site contamination via air emissions.

#### **NEXT STEPS**

ORD has submitted the manuscript that presents these results for peer reviewed publication with an anticipated publication date by March 2020. ORD is currently developing an EPA Desk Statement summarizing the communications talking points associated with this manuscript.

**An executive level briefing by ORD to Region 2 is being planned for March 3<sup>rd</sup>, at 11AM – 12 PM (eastern time). In addition, a more in-depth technical presentation and discussion will be conducted from 1:30 – 3:30 PM that same day. Arrangements will be made to include any interested AAships in any of these meetings, remotely.**

While a Communications Plan was developed between ORD and NJDEP in 2017, with input from Region 2, given the sensitivity of this matter we thought it was important to share these results. ORD expects more manuscripts to be issued as more data associated with this study become available.

If you or any members of your staff have any questions, please feel free to contact Tim Watkins, who is the Director of ORD’s Center for Environmental Measurement and Modeling (CEMM) at 919-541-5114 or [watkins.tim@epa.gov](mailto:watkins.tim@epa.gov).

Thank you,

Jennifer and Pete

Jennifer Orme-Zavaleta, PhD  
Principal Deputy Assistant Administrator for Science  
Office of Research and Development  
US Environmental Protection Agency

DC  
RT Ex. 6 Personal Privacy (PP)

Pete Lopez, Regional Administrator  
EPA – Region 2  
212-637-5000